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Rice Leaf

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Weedy Rice Survey Update

Troy Clark, Luis Espino, Whitney Brim-DeForest, UCCE

We have conducted field surveys of weedy rice in 2020 and 2025. The objectives were to document the location of weedy rice infestations, determine how severe these infestations are, and evaluate the spread of this weed.

In 2020, we inspected 15,748 acres of rice. Of these, 3,412 acres (21% of surveyed acres) had weedy rice. Five years later, in 2025, we re-inspected these fields and inspected a few fields where new infestations had been identified. In 2025 the total area inspected was 16,347 acres. Of those acres, 3,002 acres were determined to be infested with weedy rice (18% of surveyed acres).

Comparing surveys, the total acres infested with weedy rice was lower (400 acres) in 2025 than 2020. Additionally, the severity of infestations decreased. In 2025 we found an increase in the acreage infested at low levels but a decrease in the acreage infested at high levels. In 2025, 1,419 acres were infested at level 1 (less than 10 individual plants per basin), compared to 785 acres in 2020. Similarly, acreage at level 2 (more than 10 individual plants per basin) was 963 in 2025 compared to 918 in 2020. On the other hand, acreage with moderate to high infestation severity (5 patches or less to 25% of basin infested) dropped from 1,708 acres in 2020 to 619 acres in 2025.

Weedy rice types 1, 2 and 3 accounted for most of the infestations found in 2025. Acreage infested with type 1 decreased from 2,398 acres in 2020 to 936 in 2025. However, acreage of types 2 and 3 increased from 692 to 1,438 and from 292 to 513, respectively. Types 4 and 6 were not found in 2025, while type 5 was found in one 36-acre field.

We would like to thank all of those who allowed us to inspect their ranches and commend the industry on their hard work helping to slow the spread of weedy rice in the rice production areas of California. We will continue to conduct research and outreach to help combat this troublesome pest. Please visit our website for more information on weedy rice.

Seed Production Update

Timothy Blank, Director of Seed Certification Operations, California Crop Improvement Association

Approximately 28,500 acres were inspected by the California Crop Improvement Association (CCIA) in 2025, of which 25,783 acres were eligible for seed production. Of the eligible acres harvested for seed, 1,117 were enrolled in the Quality Assurance (QA) program. The 2025 acres were an increase from those in 2024.

Variety summary:

In 2025, there was production of 39 rice varieties (5 long grain, 19 medium grain, 15 short grain). Seed production exceeded 1,000 acres only for the 5 commercially grown Calrose-type varieties. Of the Calrose varieties, the ranking in acres approved was M-206 (4,660 acres), M-105 (4,218 acres), M-211 (4,126 acres), M-209 (4,105 acres), and M-210 (4,093 acres). These 5 Calrose-type varieties made up 82% of the total seed production. Also making a substantial portion of the eligible seed acres were Koshihikari (869 acres), Calmochi-203 (843 acres), and M-401 (724 acres).

One trend to note is that M-206 is on the decline in seed production acreage and the other Calrose varieties have increased. The California Cooperative Rice Research Foundation has expressed that there are plans to retire M-206. Growers who favor M-206 have an improved alternative by growing M-210, which is nearly identical to M-206, with the added benefit of rice blast resistance.

Seed Field Inspections:

381 seed fields were inspected by CCIA between 8/11-9/30. Red rice was detected in 4 seed fields. Three fields contained trace levels of a non-shattering red rice, consistent with a domesticated cultivar. One field in the QA program contained ‘Type 2’ (bronze hull) weedy rice. Great progress has been made in the past several years in purging weedy red rice from the seed supply chain. Incidence of weedy rice in commercial fields is on the decline through a combination of clean planting seed and employment of best management practices.

Incidence of rice blast was rare this year.

The Certified seed and QA programs ensure that every rice seed field is inspected by field inspectors from the California Crop Improvement Association, and every seed lot is tested, to ensure that planting seed meets industry expectations for quality seed.

Fall Update: Field Research Projects in the Sacramento Valley

Whitney Brim-DeForest, Sarah Marsh, Luis Espino, UCCE

It has been a busy year! Here is a quick recap of some of our studies.

Hedgerows: This study, initiated in 2024, is evaluating how planting rows of native species along permanent levees can influence beneficial insect activity in rice fields as well as weed pressure on levees in rice systems. Preliminary data show a shift in weed species within the hedgerow away from grasses towards broadleaf species.

Evaluating Alternatives to Double Propanil: Watergrass remains one of the most challenging weeds in rice production, and concerns about resistance have heightened the need for alternative control strategies. To address this, we have been conducting herbicide trials over the past three years at numerous grower fields and at the Rice Experiment Station. Previous trials focused on evaluating tank mixes combining Regiment® (bispyribac-sodium) and propanil with other products. This year's work refined the timing between an application of Regiment® (bispyribac-sodium) followed by propanil, as this combination was the most consistent in controlling grasses across sites from the previous two years.

Herbicides for No-Till Drill-Seeded Rice: Interest in no-till drill-seeded rice continues to grow as a potential strategy for reducing water use, input costs, and environmental impacts. However, the lack of herbicide recommendations for this system remains a key barrier to implementation. To address this, the team conducted an herbicide trial to evaluate combinations and tank mixes for no-till drill-seeded systems. The study focuses on pre- and postemergence herbicide combinations for effective control of sprangletop and watergrass. Although data will be useful for no-till systems, combinations will also be applicable for any drill-seeded rice system. This is the first study conducted in over 10 years specifically for herbicide programs in drill-seeded systems.

Winter Cover Crops: This year marked the conclusion of the three-year cover crop study at three sites across the valley. This trial yielded some key information about cover crop species selection, as well as potential insights into cover crop establishment based on soil moisture and rainfall. Preliminary results indicate that planting before heavy rainfall is a key to success, while vetches continue to be one of the best species, both in terms of biomass production as well as nitrogen production.

Winged Water Primrose: A project with several key collaborators led to the updated mapping of winged water primrose across Butte County, as well as new infestations in Placer County as well. We are working on an updated herbicide screening using both rice herbicides and those registered for use in aquatic systems (ditches, canals) to provide a way to limit the spread of this invasive pest.

Stay tuned for updates on many of these projects at the 2026 Winter Rice Grower Meetings, as well as in upcoming newsletters!

2025 Delta Rice Recap

Michelle Leinfelder-Miles, UCCE

Variety Trial: Delta rice acreage has been steadily increasing, and yields are comparable with the statewide average (Table 1). I estimate that Delta acreage approached, if not exceeded, 15,000 acres in 2025. To support the growing industry, UCCE collaborates with the California Rice Experiment Station to evaluate commercial varieties and advanced breeding lines. The San Joaquin County Delta was one of eight locations in the 2025 statewide trial. The Delta is the only drill-seeded site and is a test site for very-early maturing varieties because it has cooler growing conditions than other rice growing regions of the state. Variety trial results will be available in the February 2026 newsletter.

Armyworm Monitoring: In 2025, we monitored true armyworms on three Delta farms, and moth catches peaked around June 30th. Figure 1 shows the average catches across the three farms (9 traps total). The peak population number and timing were similar to what we observed in 2024, which was less severe than in years like 2017, 2018, 2022, and 2023. Trap catches varied across the three farms and across fields on the same farm, which is why it is important to scout for field-level impacts.

Disease Observations: I did not hear much about diseases this year. I only submitted one sample to the disease diagnostics lab at UC Davis, and they diagnosed aggregate sheath spot (Figure 2). Aggregate sheath spot is similar to stem rot because both diseases can be made worse by low potassium (K) conditions. Potassium can be limiting in some Delta soils, so proper plant nutrition is a good disease management strategy. UC Rice Specialist, Bruce Linquist, wrote this fact sheet about managing K (https://agronomy-rice.ucdavis.edu/sites/g/files/dgvnsk11966/files/inline-files/328498.pdf). If soil extractable K is less than 60 ppm, K is deficient, and if extractable K is between 60 and 120 ppm, K fertilizer would likely be beneficial. Growers who have observed aggregate sheath spot or stem rot may benefit from testing their soil for K. If K fertility is sufficient and aggregate sheath spot or stem rot are still observed, fungicide treatment is also an option. It is important to scout at late-tillering and early-heading because treatment is most effective when applied between late-boot and early-heading.

Herbicide Resistance Testing: Under the direction of UC Weed Management Specialist,

Table 1. Rice acreage and yield (medium grain).

	2024	2023	2022	2021	2020	2019	2018	2017
SJC Acreage	12,700	10,990	8,930	7,070	4,990	4,360	3,620	3,060
Proportion of statewide acreage in SJC	N/A	2%	4%	2%	1%	0.9%	0.7%	0.7%
Average SJC Yield (cwt/ac)	92	102	101	95	88	81	86	82
Average Statewide Yield (cwt/ac)	N/A	87	90	92	89	86	88	86

*Rice acreage and yield according to the San Joaquin County (SJC) Agricultural Commissioner's Crop Reports. Rice acreage in SJC is primarily in the Delta region. Delta acreage in other counties is not included in these statistics. At the time of publishing, 2024 CDFA statewide data were not yet available (N/A).

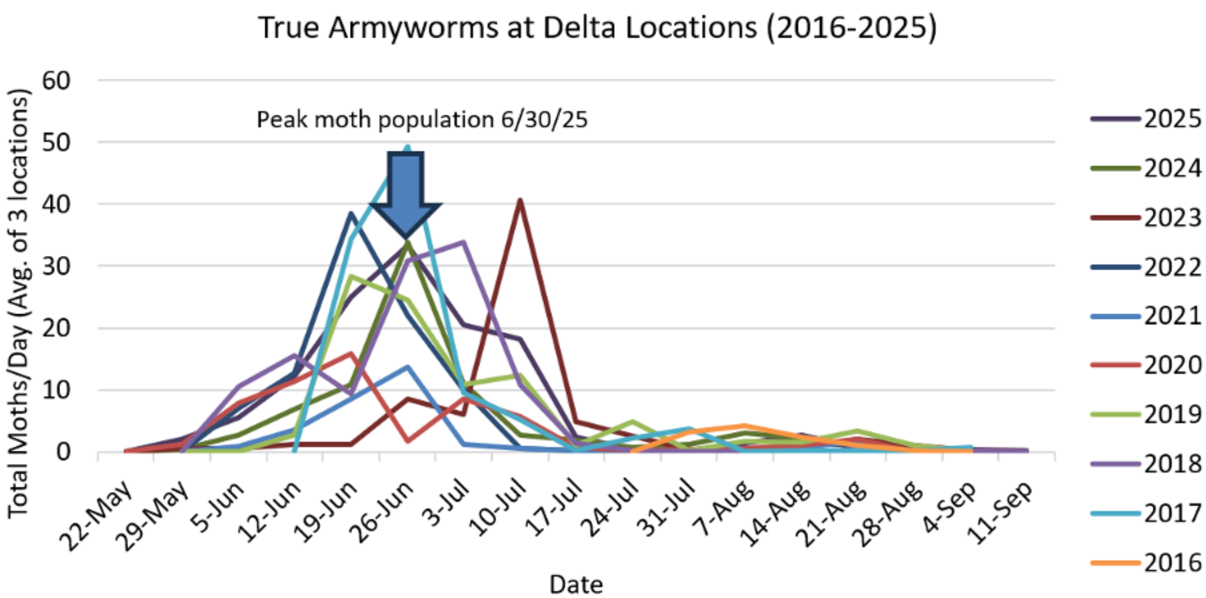


Figure 1. Delta true armyworm trap counts, 2016-2025. Used together, field scouting observations and monitoring data can inform management.

Kassim Al-Khatib, UCCE provides herbicide resistance testing for rice growers. Over the years, I have submitted about a half dozen weed seed samples for testing, and while that only represents a few fields on a few farms, the results are interesting. O

On one farm, barnyardgrass had resistance to Clincher, Regiment, and Loyant. On another farm, barnyardgrass had resistance to SuperWham!, Regiment, and Loyant. On a third farm, redstems had not developed any resistance. I have spoken with some PCAs who have suspected Regiment resistance on farms with a history of rice cultivation, and these limited results corroborate their hunches. The resistance to Loyant was curious to me since that is a newly-registered product and had not yet been used on these farms. I reached out to Kassim to ask how this could be observed. Kassim noted that Postdoctoral Scholar, Deniz Inci, also observed Loyant resistance before commercialization in research trials. His conclusion is that biotypes of barnyardgrass and watergrass species metabolize Loyant differently, and therefore, have a different response to treatment. This is important information for growers to know if they are rotating Loyant into their herbicide programs because efficacy may vary. Overall, what these resistance results indicate is that growers and PCAs should be making observations about whether their herbicide program is still effective. Using the full label rate, spraying at optimum timing (when weeds are small), and herbicide rotation are important resistance management strategies. Please call if you would like to discuss options. The resistance testing program is closed for this year, but in future years, please reach out if you would like to submit samples.

Weedy Rice: Over the years, we have identified weedy rice on a few Delta farms, so we need to stay vigilant in our efforts to prevent the spread and manage weedy rice. This summer, UCCE hosted a meeting in the Delta to extend information to the local industry. Presentations from that meeting are available from my website (https://ucanr.edu/site/delta-crops-resource-management/

[meeting-presentations](). In fields where weedy rice has been a problem, post-harvest management should include straw chopping, but ***not*** incorporation, and winter flooding. This will keep seed on the soil surface where it can potentially deteriorate over the winter. I have observed that where crop rotations have been implemented, weedy rice pressure decreases in the subsequent rice rotation, but since weedy rice seed can stay dormant for many years, time will tell how well crop rotation works over the long-term.

Figure 2. Aggregate leaf spot lesions. Lesions first appear at the water line during tillering, so early scouting is important for disease management.

Cover Cropping: We wrapped up a project funded by the CDFA Healthy Soils Program and CA Rice Research Board where we evaluated different cover crop species and whether cover cropping improves soil carbon and nitrogen dynamics in the rice system. Since rice may be grown over multiple seasons without rotation, cover crops may provide an opportunity to introduce plant diversity, including nitrogen-fixing legumes. Data from the Delta trial will be forthcoming, but overall, we observed that the brassicas emerged quickly and started covering the soil after just one month. They died off, however, when the conditions became wet. In contrast, purple and woollypod vetches and balansa clover started off slowly but had vigorous stands by early spring, despite the wet conditions.

I want to take this opportunity to thank all the growers who collaborated with us on these projects, and I wish everyone a happy harvest season.

White Water Fire Morphology and Control in California Rice

Robinson Johnson, Deniz Inci, Kassim Al-Khatib, UC Davis

The plant "white water fire" has only been found in one location in Butte County in 2023 and 2024. It was not found in 2025.

Background

White water fire (*Bergia capensis* L.) is an annual broadleaf weed native to southern China, tropical Asia, and Africa, which was recently reported in a California rice field by the Butte County Agricultural Commissioner's office in September 2023 representing the first confirmed report of this weed in California and likely in the United States. This discovery immediately raises concern regarding its spread potential, economic, and environmental impacts. White water fire seeds collected from the field had deep dormancy which required cycles of low temperature. However, seeds from greenhouse grown plants did not have any dormancy.

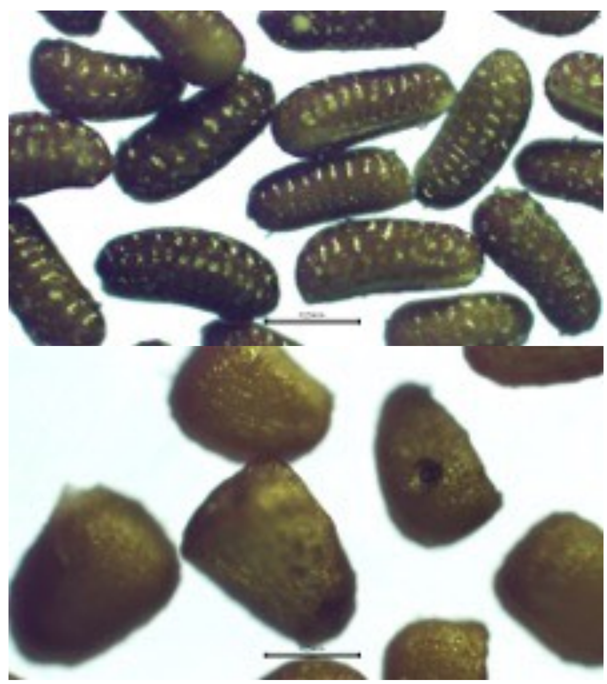
Identification

White water fire plants look similar to the more common broadleaf weed redstem (*Ammannia* spp.), leading to potential misidentification in the field. However, some of the key distinguishing features include that white water fire plant has broader, thicker, ovate leaves with having minor serration. They also distinctly produce white flowers, which all surround a round stem that is characterized by an extremely small central pith surrounded by large air spaces known as lacunae that are arranged in a highly organized radial pattern like spokes on a wheel. On the other hand, redstems produced purple flowers.

Flowers of white water fire (left) and red stem (right).

Redstem has narrower, thinner, linear leaves with a very distinct shape characterized by the base of the leaf wrapping around the stem, with the shape known as auriculate, and the overall shape of the leaf being lanceolate. These all are surrounding the stem, which distinctly varies from red to green with a clear square/rectangular shape. The internal portion of the stem differs significantly from that of white water fire, featuring a distinct, large pith in the stem area. This pith is surrounded by a more sponge-like aerenchyma/cortex with air spaces that are less organized than those of white water fire plant.

White water fire have small ellipsoid or oblong seeds that have regularly aligned rows of pits that create a ribbed look. Redstem seeds are more like a semi sphere with an overall more ovate shape. Seeds are small, so they are difficult to identify in the field. However, one key character that could assist in the field identification would be the redstem has a more yellow seed and a rounder shape while white water fire seeds are dark brown to black, longer, and oval.



Seeds of white water fire (upper picture) and red stem (lower picture).

Control

White water fire and Redstem were treated in the greenhouse with six herbicides commonly used in rice fields including Loyant CA, Grandstand CA, Regiment CA, Cliffhanger SC, RebelEX CA, and SuperWham! CA. Loyant CA was the most effective herbicide with over 95% control of white water fire seedlings at 28 days after treatment followed by Grandstand CA with 80% control. Preliminary results also confirmed that copper sulfate applications inhibit seed germination.

Herbicide	Active ingredient	Group	Rate	Unit	Timing	Control (%)
Loyant CA	florpyrauxifen-benzyl	4	1.33	pt/A	4–6 in. tall	95
Grandstand CA	triclopyr	4	1.0	pt/A	4–6 in. tall	80
Regiment CA EZ	bispyribac-sodium	2	1.4	fl oz/A	4–6 in. tall	0
Cliffhanger SC	benzobicyclon	27	10.3	fl oz/A	4–6 in. tall	15
RebelEX CA	penoxsulam + cyhalofop-butyl	1&2	20	fl oz/A	4–6 in. tall	5
SuperWham! CA	propanil	5	6	qt/A	4–6 in. tall	50
Nontreated control	—	—	—	—	—	—

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